Appendix B
Glossary

B-1. Abbreviations

ADAS . . . . Automated Data Acquisition System

ASDSO . . Association of State Dam Safety Officials

BSC . . . . . Base Safety Condition

CAGE . . . . Computer Applications in Geotechnical Engineering

COE . . . . . Corps of Engineers

CQC . . . . . Contractor Quality Control

DA . . . . . Department of the Army

DM . . . . . Design Memorandum

EAP . . . . . Emergency Action Plan

EPRI . . . . . Electric Power Research Institute

FCCSET . . Federal Coordinating Council for Science, Engineering, and Technology

FCSA . . . . Feasibility Cost Sharing Agreement

FEMA . . . . Federal Emergency Management Agency

GDM . . . . General Design Memorandum

HQUSACE . . Headquarters, U. S. Army Corp of Engineers

ICODS . . . Interagency Committee on Dam Safety

ICOLD . . . International Commission on Large Dams

IDF . . . . . Inflow Design Flood

IPMP . . . . Initial Project Management Plan

IRC . . . . . Issue Resolution Conference

MCE . . . . . Maximum Credible Earthquake

MDE . . . . . Maximum Design Earthquake

MSC . . . . . Major Subordinate Commands

O&M . . . . . Operation and Maintenance

OBE . . . . . Operating Basis Earthquake

OMRR&R . . . . . Operation, Maintenance, Repair, Replacement and Rehabilitation

P&S . . . . . Plans and Specifications

PCA . . . . . Project Cooperation Agreement

PED . . . . . Preconstruction Engineering and Design

PMF . . . . . Probable Maximum Flood

PMP . . . . . Probable Maximum Precipitation

PROSPECT . . . . . Proponent-Sponsored Engineer Corps Training

QA . . . . . Quality Assurance

REMR . . . . . Repair, Evaluation, Maintenance, and Rehabilitation

SDF . . . . . Spillway Design Flood

SEE . . . . . Safety Evaluation Earthquake

SEF . . . . . Safety Evaluation Flood

TADS . . . . . Training Aids for Dam Safety

TRC . . . . . Technical Review Conference

USACE . . . . . United States Army Corps of Engineers

USCOLD . . . . . U.S. Committee on Large Dams

VE . . . . . Value Engineering

WES . . . . . U.S. Army Engineer Waterways Experiment Station

B-2. Terms

Abutment
That part of the valley side against which the dam is constructed. An artificial abutment is sometimes constructed as a concrete gravity section to take the thrust of an arch dam where there is no suitable natural abutment. The left and right abutments of dams are defined with the observer viewing the dam looking in the downstream direction, unless otherwise indicated.

Acre-foot
A unit of volumetric measure that would cover 1 acre to a depth of 1 foot. It is equal to 43,560 cubic feet.

Adit
A nearly horizontal underground excavation in an abutment having an opening in only one end. An opening in the face of a dam for access to galleries or operating chambers.

Appurtenant structure
Ancillary features of a dam such as inlet and outlet works, spillways, tunnels, or powerplants.

Axis of dam
The vertical plane or curved surface, chosen by a designer, appearing as a line, in plan, or in cross-section, to which the horizontal dimensions of the dam are referenced.

Baffle block
A block, usually of concrete, constructed in a channel or stilling basin to dissipate the energy of water flowing at high velocity.

Base thickness
Also referred to as base width. The maximum thickness or width of the dam measured horizontally between upstream and downstream faces and normal to the axis of the dam, but excluding projections for outlets, or other appurtenant structures.

Batter
Angle of inclination from the vertical.

Bedrock
The consolidated body of natural solid mineral matter which underlies the overburden soils.

Berm
A nearly horizontal step in the sloping profile of an embankment dam. Also a step in a rock or earth cut.

Borrow area
The area from which material for an embankment is excavated.

Breach
An eroded opening through a dam which drains the reservoir. A controlled breach is a constructed opening. An uncontrolled breach is an unintentional opening which allows uncontrolled discharge from the reservoir.

Catastrophe
A sudden and great disaster causing misfortune, destruction, or irreplaceable loss extensive enough to cripple activities in an area.

Channel
A general term for any natural or artificial facility for conveying water.

Cofferdam
A temporary structure enclosing all or part of the construction area so that construction can proceed in the dry. A diversion cofferdam diverts a river into a pipe, channel, or tunnel.

Compaction
Mechanical action which increases the density by reducing the voids in a material.

Conduit
A closed channel to convey water through, around, or under a dam.

Construction joint
The interface between two successive placings or pours of concrete where bond, and not permanent separation, is intended.

Contact grouting
Filling, with cement grout, any voids existing at the contact of two zones of different materials, e.g., between a concrete tunnel lining and the surrounding rock.

Contractor Quality Control (CQC)
The construction contractor's system to manage, control, and document his own, his supplier's, and his subcontractor's activities to comply with contract requirements.

Core
A zone of low permeability material in an embankment dam. The core is sometimes referred to as central core, inclined core, puddle clay core, rolled clay core, or impervious zone.

Core wall
A wall built of relatively impervious material, usually of concrete or asphaltic concrete, in the body of an embankment dam to prevent seepage.

Crest of dam
See top of dam.

Cross section
An elevation view of a dam formed by passing a plane through the dam perpendicular to the axis.

Cutoff trench
A foundation excavation later to be filled with impervious material so as to limit seepage beneath a dam.

Cutoff wall
A wall of impervious material usually of concrete, asphaltic concrete, or steel sheet piling constructed in the foundation and abutments to reduce seepage beneath and adjacent to the dam.

Dam
A barrier constructed across a watercourse for the purpose of storage, control, or diversion of water.

a. Afterbay dam. See regulating dam.

b. Ambursen dam. A buttress dam in which the upstream part is a relatively thin flat slab usually made of reinforced concrete.

c. Arch dam. A concrete or masonry dam which is curved upstream so as to transmit the major part of the water load to the abutments.

d. Buttress dam. A dam consisting of a watertight part supported at intervals on the downstream side by a series of buttresses. A Buttress dam can take many forms, such as a flat slab or a massive head buttress.

e. Cofferdam. A temporary structure enclosing all or part of the construction area so that construction can proceed in the dry. A diversion cofferdam diverts a stream into a pipe, channel, tunnel, or other watercourse.

f. Crib dam. A gravity dam built up of boxes, crossed timbers, or gabions filled with earth or rock.

g. Diversion dam. A dam built to divert water from a waterway or stream into a different water-course.

m. Hydraulic fill dam. An earth dam constructed of materials, often dredged, which are conveyed and placed by suspension in flowing water.

n. Industrial waste dam. An embankment dam, usually built in stages, to create storage for the disposal of waste products from an industrial process. The waste products are conveyed as fine material suspended in water to the reservoir impounded by the embankment. The embankment may be built of conventional materials but sometimes incorporates suitable waste products.

o. Masonry dam. Any dam constructed mainly of stone, brick, or concrete blocks jointed with mortar. A dam having only a masonry facing should not be referred to as a masonry dam.

p. Mine tailings dam. An industrial waste dam in which the waste materials come from mining operations or mineral processing.

q. Multiple arch dam. A buttress dam composed of a series of arches for the upstream face.

r. Overflow dam. A dam designed to be overtopped.

h. Double curvature arch dam. An arch dam which is curved vertically as well as horizontally.

i. Earth dam. An embankment dam in which more than 50 percent of the total volume is formed of compacted earth material generally smaller than 3-inch size.

j. Embankment dam. Any dam constructed of excavated natural materials or of industrial waste materials.

k. Gravity dam. A dam constructed of concrete and/or masonry which relies on its weight and internal strength for stability.

l. Hollow gravity dam. A dam constructed of concrete and/or masonry on the outside but having a hollow interior and relying on its weight for stability.

s. Regulating dam. A dam impounding a reservoir from which water is released to regulate the flow downstream.

t. Rockfill dam. An embankment dam in which more than 50 percent of the total volume is composed of compacted or dumped cobbles, boulders, rock fragments, or quarried rock generally larger than 3-inch size.

u. Roller-compacted concrete dam. A concrete gravity dam constructed by the use of a dry mix concrete transported by conventional construction equipment and compacted by rolling, usually with vibratory rollers (EM 1110-2-2006, Hansen and Reinhardt 1991).[1]

[1] References cited in the appendixes are listed in Appendix A.

v. Rubble dam. A stone masonry dam in which the stones are unshaped or uncoursed.

w. Saddle dam (or dike). A subsidiary dam of any type constructed across a saddle or low point on the perimeter of a reservoir.

x. Tailings dam. See mine tailings dam.

Dam failure
The uncontrolled release of impounded water. It is recognized that there are lesser degrees of failure and that any malfunction or abnormality outside the design assumptions and parameters which adversely affect a dam's primary function of impounding water is properly considered a failure. They are, however, normally amenable to corrective action.

Dam safety
This term not only covers the safeguarding of human life and downstream property but also the satisfactory operation of the structure. The safety of a dam manifests itself in being free of conditions that could lead to the deterioration or destruction of the dam. The margin which separates the actual conditions of a dam from those leading to its damage or destruction is a measure of its safety. To be safe, a dam has to have appropriate reserves, taking into account all scenarios of normal utilization and exceptional hazard which it may have to withstand during its life (International Commission on Large Dams 1987).

Dam safety preparedness
The quality or state of being prepared to deal with emergency conditions which endanger the structural integrity of the dam and/or downstream property and human life.

Design water level
The maximum water elevation including the flood surcharge that a dam is designed to withstand.

Design wind
The most severe wind that is reasonably possible at a particular reservoir for generating wind setup and runup. The determination will generally include the results of meteorologic studies which combine wind velocity, duration, direction, and seasonal distribution characteristics in a realistic manner.

Diaphragm wall (membrane)
A sheet, thin zone, or facing made of an impervious material such as concrete, steel, wood, or plastic. Also see core wall.

Dike
See saddle dam.

Diversion channel, canal, or tunnel
A waterway used to divert water from its natural course. The term is generally applied to a temporary arrangement, e.g., to by-pass water around a damsite during construction. "Channel" is normally used instead of "canal" when the waterway is short.

Drain, blanket
A layer of pervious material placed to facilitate drainage of the foundation and/or embankment.

Drain, chimney
A vertical or inclined layer of pervious material in an embankment to facilitate and control drainage of the embankment fill.

Drain, toe
A system of pipe and/or pervious material along the downstream toe of a dam used to collect seepage from the foundation and embankment and convey it to a free outlet.

Drainage area
The area which drains to a particular point on a river or stream.

Drainage curtain
Also called drainage wells or relief wells. A line of vertical wells or boreholes to facilitate drainage of the foundation and abutments and to reduce water pressure.

Drawdown
The difference between a water level and a lower water level in a reservoir within a particular time. Used as a verb, it is the lowering of the water surface.

Earthquake
A sudden motion or trembling in the earth caused by the abrupt release of accumulated stress along a fault.

Earthquake, Maximum Credible (MCE)
The most severe earthquake that can be expected to occur at a given site on the basis of geologic and seismological evidence.

Earthquake, Maximum Design (MDE)

A postulated seismic event, specified in terms of specific bedrock motion parameters at a given site, which is used to evaluate the seismic resistance of man-made structures or other features at the site.

Earthquake, Operating Basis (OBE)
The earthquake(s) for which the structure is designed to resist and remain operational. It reflects the level of earthquake protection desired for operational or economic reasons and may be determined on a probabilistic basis considering the regional and local geology and seismology.

Earthquake, Safety Evaluation (SEE)
The earthquake, expressed in terms of magnitude and closest distance from the dam site or in terms of the characteristics of the time history of free-field ground motions, for which the safety of the dam and critical structures associated with the dam are to be evaluated. In many cases, this earthquake will be the maximum credible earthquake to which the dam will be exposed. However, in other cases where the possible sources of ground motion are not easily apparent, it may be a motion with prescribed characteristics selected on the basis of a probabilistic assessment of the ground motions that may occur in the vicinity of the dam. To be considered safe, it should be demonstrated that the dam can withstand this level of earthquake shaking without release of water from the reservoir.

Earthquake, synthetic
Earthquake time history records developed from mathematical models that use white noise, filtered white noise, and stationary and nonstationary filtered white noise, or theoretical seismic source models of failure in the fault zone. (White noise is random energy containing all frequency components in equal proportions. Stationary white noise is random energy with statistical characteristics that do not vary with time).

Embankment
A raised structure to hold back water or to carry a roadway.

Emergency
An emergency, in terms of dam operation, is a condition which develops unexpectedly, endangers the structural integrity of the dam and/or downstream property and human life, and requires immediate action.

Emergency Action Plan (EAP)
A plan of action to be taken to reduce the potential for property damage and loss of life in an area affected by a dam failure or large flood.

Energy dissipator
A device constructed in a waterway to reduce the kinetic energy of fast flowing water.

Epicenter
The point on the earth's surface located vertically above the point of origin of an earthquake.

Fault
A fracture or fracture zone in the earth crust along which there has been displacement of the two sides relative to one another.

Fault, active
A fault which, because of its present tectonic setting, can undergo movement from time to time in the immediate geologic future.

Fault, capable
An active fault that is judged capable of producing macroearthquakes and exhibits one or more of the following characteristics:

a. Movement at or near the ground surface at least once within the past 35,000 years.

b. Macroseismicity (3.5 magnitude Richter or greater) instrumentally determined with records of sufficient precision to demonstrate a direct relationship with the fault.

c. A structural relationship to a capable fault such that movement on one fault could be reasonably expected to cause movement on the other.

d. Established patterns of microseismicity which define a fault, with historic macroseismicity that can reasonably be associated with the fault.

Fetch
The straight line distance across a body of water subject to wind forces. The fetch is one of the factors used in calculating wave heights in a reservoir.

Filter (filter zone)
One or more layers of granular material graded (either naturally or by selection) so as to allow seepage through or within the layers while preventing the migration of material from adjacent zones.

Flashboards
Structural members of timber, concrete, or steel placed in channels or on the crest of a spillway to raise the reservoir water level but that may be quickly removed in the event of a flood.

Flip bucket
An energy dissipator located at the downstream end of a spillway and shaped so that water flowing at a high velocity is deflected upwards in a trajectory away from the foundation of the spillway.

Flood
A temporary rise in water levels resulting in inundation of areas not normally covered by water. May be expressed in terms of probability of exceedance per year such as one percent chance flood or expressed as a fraction of the probable maximum flood or other reference flood.

Flood routing
A process of determining progressively over time the amplitude of a floodwave as it moves past a dam or downstream to successive points along a river or stream.

Flood, antecedent
A flood or series of floods assumed to occur prior to the occurrence of an inflow design flood.

Flood, base safety standard (BSS)
The inflow design flood where there is no significant increase in adverse consequences from dam failure compared to non-failure adverse consequences.

Flood, Safety Evaluation (SEF)
The largest flood for which the safety of a dam and appurtenant structure is to be evaluated.

Flood, Inflow Design (IDF)
The flood used in the design of a dam and its appurtenant works particularly for sizing the spillway and outlet works, and for determining maximum temporary storage and height of dam requirements.

Flood, Probable Maximum (PMF)
The most severe flood that is considered reasonably possible at a site as a result of meteorologic and hydrologic conditions.

Floodplain
An area adjoining a body of water or natural stream that has been or may be covered by floodwater.

Freeboard
Vertical distance between the design water level and the top of dam.

Full pool
The reservoir level that would be attained when the reservoir is fully utilized for all project purposes, including flood control.

Gallery
A passageway in the body of a dam used for inspection, foundation grouting, and/or drainage.

Gantry crane
A fixed or traveling bent-supported crane for handling heavy equipment.

Gate
A movable, watertight barrier for the control of water in a waterway.

a. Bascule gate. See flap gate.

b. Bulkhead gate. A gate used either for temporary closure of a channel or conduit before dewatering it for inspection or maintenance or for closure against flowing water when the head difference is small, e.g., for diversion tunnel closure.

c. Crest gate (spillway gate). A gate on the crest of a spillway to control the discharge or reservoir water level.

d. Drum gate. A type of spillway gate consisting of a long hollow drum. The drum may be

held in its raised position by the water pressure in a flotation chamber beneath the dam.

e. Emergency gate. A standby or auxiliary gate used when the normal means of water control is not available. Sometimes referred to as guard gate.

f. Fixed wheel gate (fixed roller gate or fixed axle gate). A gate having wheels or rollers mounted on the end posts of the gate. The wheels bear against rails fixed in side grooves or gate guides.

g. Flap gate. A gate hinged along one edge, usually either the top or bottom edge. Examples of bottom-hinged flap gates are tilting gates and fish belly gates so called from their shape in cross section.

h. Flood gate. A gate to control flood release from a reservoir.

i. Outlet gate. A gate controlling the flow of water through a reservoir outlet.

j. Radial gate (tainter gate). A gate with a curved upstream plate and radial arms hinged to piers or other supporting structure.

k. Regulating gate (regulating valve). A gate or valve that operates under full pressure flow conditions to regulate the rate of discharge.

l. Roller drum gate. See drum gate.

m. Roller gate (stoney gate). A gate for large openings that bears on a train of rollers in each gate guide.

n. Skimmer gate. A gate at the spillway crest whose prime purpose is to control the release of debris and logs with a limited amount of water. It is usually a bottom hinged flap or Bascule gate.

o. Slide gate (sluice gate). A gate that can be opened or closed by sliding in supporting guides.

Gate chamber
Also called valve chamber. A room from which a gate or valve can be operated, or sometimes in which the gate is located.

Geotextiles
Any fabric or textile (natural or synthetic) when used as an engineering material in conjunction with soil, foundations, or rock. Geotextiles have the following uses: drainage, filtration, separation of materials, reinforcement, moisture barriers, and erosion protection.

Groin
The area along the contact (or intersection) of the face of a dam with the abutments.

Grout
A fluidized material that is injected into soil, rock, concrete, or other construction material to seal openings and to lower the permeability and/or provide additional structural strength. There are four major types of grouting materials: chemical, cement, clay, and bitumen.

Grout curtain
One or more zones, usually thin, in the foundation into which grout is injected to reduce seepage under or around a dam.

Grout blanket
An area of the foundation systematically grouted to a uniform shallow depth.

Grout cap
A concrete pad constructed to facilitate subsequent pressure grouting of the grout curtain.

Hazard classification
The rating for a dam based on the potential consequences of failure. The rating is based on potential for loss of life and damage to property that failure of that dam could cause. Such classification is related to the amount of development downstream of a dam.

Head, static
The vertical distance between two points in a fluid.

Head, velocity
The vertical distance that would statically result from the velocity of a moving fluid.

Headrace

A free-flow tunnel or open channel that conveys water to the upper end of a penstock; hence, the terms "headrace tunnel" and "headrace canal."

Heel
The junction of the upstream face of a gravity or arch dam with the ground surface. For an embankment dam the junction is referred to as the upstream toe of the dam.

Height, above ground
The maximum height from natural ground surface to the top of a dam.

Height, hydraulic
The vertical difference between the maximum design water level and the lowest point in the original streambed.

Height, structural
The vertical distance between the lowest point of the excavated foundation to the top of the dam.

Hydrograph, breach or dam failure
A flood hydrograph resulting from a dam breach.

Hydrograph, flood
A graphical representation of the flood discharge with respect to time for a particular point on a stream or river.

Hydrograph, unit
A hydrograph with a volume of 1 inch of runoff resulting from a storm of a specified duration and areal distribution. Hydrographs from other storms of the same duration and distribution are assumed to have the same time base but with ordinates of flow in proportion to the runoff volumes.

Hypocenter
The point or focus within the earth which is the center of an earthquake and the origin of its elastic waves.

Inclinometer
An instrument, usually consisting of a metal or plastic tube inserted in a drill hole and a sensitized monitor either lowered into the tube or fixed within the tube. This measures at different points the tube's inclination to the vertical. By integration, the lateral position at different levels of the tube may be found relative to a point, usually the top or bottom of the tube, assumed to be fixed. The system may be used to measure settlement during embankment construction (Bartholomew, Murray, and Goins 1987). A reference benchmark is used to establish the top of the inclinometer casing. The instrument probe is lowered to each slip joint in the casing, and the depth to each joint is read directly off the tape. Settlement measurements are made as each section of casing is added during embankment construction.

Initial reservoir filling
A deliberate impoundment to meet project purposes (a continuing process as successively higher pools are attained for flood control projects).

Instrumentation
An arrangement of devices installed into or near dams (i.e., piezometers, inclinometers, strain gages, measurement points, etc.) which provide for measurements that can be used to evaluate the structural behavior and performance parameters of the structure.

Intake
Any structure in a reservoir, dam, or river through which water can be discharged.

Inundation map
A map delineating the area that would be flooded by a particular flood event.

Length of dam
The length along the top of the dam. This also includes the spillway, powerplant, navigation lock, fish pass, etc., where these form part of the length of

the dam. If detached from the dam these structures should not be included.

Liquefaction
A condition whereby soil undergoes continued deformation at a constant low residual stress or with low residual resistance, due to the buildup and maintenance of high pore water pressures, which reduces the effective confining pressure to a very low value. Pore pressure buildup leading to liquefaction may be due either to static or cyclic stress applications

and the possibility of its occurrence will depend on the void ratio or relative density of a cohesionless or slightly cohesive soil and the confining pressure.

Logboom
A chain of logs, drums, or pontoons secured end to end and floating on the surface of a reservoir so as to divert floating debris, trash, and logs.

Maximum flood control level
The highest elevation of the flood control storage.

Maximum pool
The highest pool elevation resulting from the inflow design flood.

Maximum wave
The highest wave in a wave group.

Minimum operating level
The lowest level to which the reservoir is drawn down under normal operating conditions.

Observation well
A hole used to observe the groundwater surface at atmospheric pressure within soil or rock.

Outlet
An opening through which water can be discharged.

Outlet works
A device to provide controlled releases from a reservoir.

Parapet wall
A solid wall built along the top of a dam (upstream or downstream edge) used for ornamentation, for safety of vehicles and pedestrians, or to prevent overtopping caused by wave runup.

Penstock
A pressurized pipeline or shaft between the reservoir and hydraulic machinery.

Phreatic surface
The free surface of water seeping at atmospheric pressure through soil or rock.

Piezometer
An instrument used for measuring fluid pressure (air or water) within soil, rock, or concrete.

Piping
The progressive development of internal erosion by seepage.

Plunge pool
A natural or artificially created pool that dissipates the energy of free falling water.

Pore water pressure
The interstitial pressure of water within a mass of soil, rock, or concrete.

Probability
The likelihood of an event occurring.

Probable Maximum Precipitation (PMP)
Theoretically, the greatest depth of precipitation for a given duration that is physically possible over a given size storm area at a particular geographical location.

Pumped storage reservoir
A reservoir filled entirely or mainly with water pumped from outside its natural drainage area.

Quality (as related to construction)
Conformance to properly developed requirements.

Quality Assurance (QA)
The procedure by which the Government fulfills its responsibility to be certain the contractor's quality control is functioning and the specified end product is realized.

Quality Management
All control and assurance activities instituted to achieve the product quality established by the contract requirements.

Reservoir
A body of water impounded by a dam and in which water can be stored.

Reservoir regulation (or operating) procedure
Operating procedures that govern reservoir storage and releases.

Reservoir surface area
The area covered by a reservoir when filled to a specified level.

Riprap
A layer of large uncoursed stone, precast blocks, bags of cement, or other suitable material, generally placed on the upstream slopes of an embankment or along a watercourse as protection against wave action, erosion, or scour. Riprap is usually placed by dumping or other mechanical methods and in some cases is hand placed. It consists of pieces of relatively large size as distinguished from a gravel blanket.

Risk
The relationship between the consequences resulting from an adverse event and its probability of occurrence.

Risk assessment
As applied to dam safety, the process of identifying the likelihood and consequences of dam failure to provide the basis for informed decisions on a course of action.

Rock anchor
A steel rod or cable placed in a hole drilled in rock, held in position by grout, mechanical means, or both. In principle, the same as a rock bolt, but usually the rock anchor is more than 4 meters long.

Rock bolt
A steel rod placed in a hole drilled in rock, held in position by grout, mechanical means, or both. A rock bolt can be pretensioned.

Runup
The vertical distance above the setup that the rush of water reaches when a wave breaks on the dam embankment.

Seepage
The interstitial movement of water that may take place through a dam, its foundation, or its abutments.

Significant wave height
The average height of the one-third highest waves of a given wave group.

Sill
A submerged structure across a river to control the water level upstream. The crest of a spillway. A horizontal gate seating, made of wood, stone, concrete, or metal at the invert of any opening or gap in a structure; hence, the expressions "gate sill" and "stoplog sill."

Slope
Inclination from the horizontal. Sometimes referred to as batter when measured from vertical.

Sluice
An opening for releasing water from below the static head elevation.

Spillway
A structure over or through which flow is discharged from a reservoir. If the rate of flow is controlled by mechanical means such as gates, it is considered a controlled spillway. If the geometry of the spillway is the only control, it is considered an uncontrolled spillway.

Spillway, auxiliary
Any secondary spillway which is designed to be operated very infrequently and possibly in anticipation of some degree of structural damage or erosion to the spillway during operation.

Spillway, primary (or service)
A spillway designed to provide continuous or frequent releases from a reservoir without significant damage to either the dam or its appurtenant structures.

Spillway Design Flood (SDF)
See Flood, Inflow Design.

Spillway channel
An open channel or closed conduit conveying water from the spillway inlet downstream.

Spillway chute
A steeply sloping spillway channel that conveys discharges at supercritical velocities.

Spillway crest

The lowest level at which water can flow over or through the spillway.

Spillway, fuse plug
A form of auxiliary spillway consisting of a low embankment designed to be overtopped and washed away during an exceptionally large flood.

Spillway, shaft
A vertical or inclined shaft into which water spills and then is conveyed through, under, or around a dam by means of a conduit or tunnel. If the upper part of the shaft is splayed out and terminates in a circular horizontal weir, it is termed a bellmouth or morning glory spillway.

Stilling basin
A basin constructed to dissipate the energy of rapidly flowing water, e.g., from a spillway or outlet, and to protect the riverbed from erosion.

Stoplogs
Large logs, timbers, or steel beams placed on top of each other with their ends held in guides on each side of a channel or conduit so as to provide a cheaper or more easily handled means of temporary closure than a bulkhead gate.

Storage
The retention of water or delay of runoff either by planned operation, as in a reservoir, or by temporary filling of overflow areas, as in the progression of a flood wave through a natural stream channel. Definitions of specific types of storage in reservoirs are:

a. Dead storage. The storage that lies below the invert of the lowest outlet and that, therefore, cannot readily be withdrawn from the reservoir.

b. Inactive storage. The storage volume of a reservoir between the crest of the invert of the lowest outlet and the minimum operating level.

c. Active storage. The volume of the reservoir that is available for some use such as power generation, irrigation, flood control, or water supply. The bottom elevation is the minimum operating level.

d. Live storage. The sum of the active and the inactive storage.

e. Reservoir capacity. The sum of the dead and live storage of the reservoir.

f. Flood surcharge. The storage volume between the top of the active storage and the design water level.

Surcharge
Any storage above the full pool.

Tailrace
The tunnel, channel, or conduit that conveys the discharge from the turbine to the river; hence, the terms "tailrace tunnel" and "tailrace canal."

Tailwater level
The level of water in the tailrace at the nearest free surface to the turbine or in the discharge channel immediately downstream of the dam.

Threshold Flood
The flood that fully utilizes the existing dam, i.e., the flood that just exceeds the design maximum water surface elevation at the dam.

Thrust block
A massive block of concrete built to withstand a thrust or pull.

Toe of dam
The junction of the face of a dam with the ground surface. For concrete dams, see heel.

Top thickness (top width)
The thickness or width of a dam at the level of the top of dam (excluding corbels or parapets). In general, the term thickness is used for gravity and arch dams, and width is used for other dams.

Top of dam
The elevation of the uppermost surface of a dam, usually a road or walkway excluding any parapet wall, railing, etc.

Trashrack
A device located at an intake to prevent floating or submerged debris from entering the intake.

Tunnel
A long underground excavation with two or more openings to the surface, usually having a uniform cross section used for access, conveying flows, etc.

Uplift
The uplift pressure in the pores of a material (interstitial pressure) or on the base of a structure.

Upstream blanket
An impervious blanket placed on the reservoir floor and abutments upstream of a dam. For an embankment dam, the blanket may be connected to the core.

Valve
A device fitted to a pipeline or orifice in which the closure member is either rotated or moved transversely or longitudinally in the waterway so as to control or stop the flow.

a. Hollow jet valve. A device for regulating high-pressure outlets. Essentially, it is half a needle valve in which the needle closure member moves upstream toward the inlet end of the valve to shut off flow. As there is no convergence at the outlet end, the flow emerges in the form of an annular cylinder, segmented by several splitter ribs for admitting air into the jet interior to prevent jet instability.

b. Regulating sleeve valve. A valve for regulating high pressure outlets and ensuring energy dissipation. Inside the valve there is a fixed-cone, pointed upstream, which ensures dispersion of the jet. Outside the valve a cylindrical sleeve moves downstream to shut off flow by sealing on the periphery of the cone.

Volume of dam
The total space occupied by the materials forming the dam structure computed between abutments and from top to bottom of dam. No deduction is made for small openings such as galleries, adits, tunnels, and operating chambers within the dam structure. Portions of powerplants, locks, spillway, etc., should be included only if they are necessary for the structural stability of the dam.

Watershed divide
The divide or boundary between catchment areas (or drainage areas).

Waterstop
A strip of metal, rubber, or other material used to prevent leakage through joints between adjacent sections of concrete.

Wave runup
Vertical height above the stillwater level to which

water from a specific wave will run up the face of a structure or embankment.

Weir
A notch of regular form through which water flows.

a. Weir, broad-crested. An overflow structure on which the nappe is supported for an appreciable length in the direction of flow.

b. Weir, measuring. A device for measuring the rate of flow of water. It generally consists of a rectangular, trapezoidal, triangular, or other shaped notch, located in a vertical, thin plate over which water flows. The height of water above the weir crest is used to determine the rate of flow.

c. Weir, ogee. A reverse curve, shaped like an elongated letter "S." The downstream faces of overflow spillways are often made to this shape.

Wind setup
The vertical rise in the stillwater level at the face of a structure or embankment caused by wind stresses on the surface of the water.